Protective Equipment

Developing a New Analysis of Manikin Data (AMANDA) Model to Streamline and Improve Processes for Accelerative Injury Analyses for LFT&E Underbody Blast

During a LFT&E underbody blast event, biomechanical response data from acceleration is collected, processed, and analyzed. The data are used to assess injuries associated with the accelerative loading measured during the test, and to determine the cause of these injuries in order to ultimately identify vehicle design changes that prevent injury from underbody blast. Numerous tools and processes are required to generate the ARL's current and legacy accelerative injury analyses for LFT&E underbody blast. This suite of tools and processes are laborious and prone to introduce human error. Based on knowledge and experience in accelerative loading and associated underbody blast injury analyses, enhancements were made to the model and processes to streamline and improve the efficiency, accuracy, and timeliness of accelerative injury analyses by ARL's Survivability/Lethality Analysis Directorate. This directorate developed a single software package under one configuration-controlled model, AMANDA, for release in FY16. The new version of AMANDA has reduced the number of steps, tools, and cycle time by a minimum of 60 percent. The model has been designed to be easily extendable to support the forthcoming WIAMan manikin and associated injury criteria to enhance LFT&E practices ground vehicles for underbody blast threats. It has been transferred to the Blast Protection for Platforms and Personnel Institute for its use. While the previous process shortcomings did not negate the ability to perform analyses, addressing them improves quality and performance, ensures on-time delivery of accurate products, and reduces the number of steps, human error, time, and cost to produce a high-value product for program offices and evaluators for LFT&E.